

REMARKS

Claims 1, 7, 14, 17, 18, 19, 21, 24, 30-33 have been amended. Claims 15, 22, and 23 have been canceled. New claims 40 and 41 have been added. Reconsideration and allowance are respectfully requested.

Regarding the 35 U.S.C. § 112 rejection

Claim 7 has been amended to remove the antecedent basis problem. The “capped tubular vessel” has been changed to the “tubular vessel”.

Regarding the 35 U.S.C. § 102(a) rejection

Claims 1- 4, 6, 9, 14, 17, 18, 20, 21, 25-27, 29, 33, 34, 36, and 37 stand rejected as being anticipated by *Tomes, et al.* (U.S. Patent No. 5,921,477). Applicant has amended claims 1, 14, 17 and 33. Claims 40 and 41 have been added. The aforementioned claims 1, 14, 17, 33 and 40-41 now include a limitation relating to substantially frictionless reciprocation of a drive shaft/rod. More specifically, claims 1, 14 and 40-41 recite the use of an air bearing to support substantially frictionless drive shaft/rod reciprocation. Applicant has amended claim 21 to emphasize the presence of end caps with spherical recesses having substantially identical radii. Applicant has further amended claim 30 to emphasize the presence of end caps, each having a radius that is substantially identical to that of the vessel or tube.

In regard to the substantially frictionless and air bearing limitations, *Tomes, et al.* discloses only a reciprocating member 24 which passes through a high friction bushing 43 coupled to the housing (Col. 3, lns 35-38). No teaching or suggestion is made for substantially

frictionless drive shaft/rod reciprocation or for the use of an air bearing. In regard to the shape of the end caps, *Tomes, et al.* does not disclose a particular spherical recess shape of the end cap (Col. 4, Ins. 1-4). *Tomes, et al.* accordingly fails to anticipate the claimed invention.

Claim 30 stands rejected as being anticipated by US Patent No. 4,050,897 (*Klein*), US Patent No. 5,702,060 (*Matteazzi, et al.*), or US Patent No. 5,029,760 (*Gamblin*). Like *Tomes, et al.*, the cited references neither teach nor suggest a particular shape for the end cap recess. *Klein*, *Matteazzi, et al.* and *Gamblin* accordingly fail to anticipate the claimed invention which is directed to using spherical recesses with matching radii.

Regarding the 35 U.S.C. §103 rejection

Claims 1-29, 33-39 stand rejected under 35 U.S.C. §103 (a) as being unpatentable over the admitted prior art (described in the Official Action as A.P.A.) in view *Tomes, et al.* Claims 1, 14, 17, 33, 40, and 41 now emphasize substantially frictionless shaft/rod reciprocation (for example, using an air bearing). Applicant has further amended the claims 21 and 30 to emphasize the use of end caps having spherical recesses with substantially identical radii. The *Tomes, et al.* reference does not appear to teach or suggest substantially frictionless shaft/rod operation or the use of an air bearing in combination with a ball mill. On the contrary, the friction bushing 43 in the *Tomes, et al.* reference appears to teach away from the claimed invention.

Further, neither the A.P.A nor the cited art teach the use of complimentary spherical surface recesses having substantially identical radii.

Claims 30-32 stand rejected as being unpatentable over the A.P.A. in view of *Tomes* and further in view of *Klein*, *Matteazzi, et al.*, or *Gamblin*. Neither of the cited references teaches or

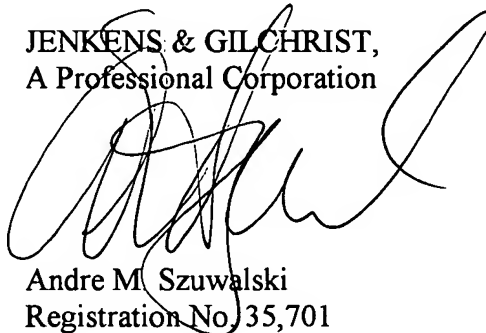
suggests that the efficiency of the grinding process could be improved by using end caps with spherical surface recess shapes having substantially identical radii.

Should the Examiner have any further questions or comments facilitating allowance, the Examiner is invited to contact Applicant's representative indicated below to further prosecution of this application to allowance and issuance.

In view of the above, it is believed that this application is in condition for allowance, and such a Notice is respectfully requested.

Respectfully submitted,

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